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Description of a new species of *Campsosternus* Latreille, 1834 from northern Sichuan, China (Coleoptera: Elateridae)

Lu QIU[1,4], Yong-Ying RUAN[2,5], Shao-Zhi ZHENG[3,6] & Jian-Yue QIU[1*]

[1]School of Life Sciences (School of Ecological Forestry), Mianyang Teachers' College, Mianxing West Road, 621000, Mianyang, Sichuan, China

[2]Plant Protection Research Center, Shenzhen Polytechnic University, Shenzhen 518055, China

[3]Sichuan Mianyang Ecological Environment Monitoring Center Station, Mianyang 621000, Sichuan, China

[4]https://orcid.org/0000-0002-0946-1634; 123church@163.com

[5]https://orcid.org/0000-0002-5025-5592; yongyingruan@hotmail.com

[6]https://orcid.org/0009-0004-1576-4641; 625534532@qq.com

*Corresponding author. https://orcid.org/0000-0002-4955-2944; qiujy@yahoo.com

Abstract: A new species of the rainbow click-beetle genus *Campsosternus* Latreille, 1834, *Campsosternus pingwuensis* L. Qiu, Y.-Y. Ruan & J.-Y. Qiu, **sp. nov.**, is described and illustrated from Pingwu County, Mianyang City, Sichuan Province, China. The new species is morphologically similar to *Campsosternus gemma* Candèze, 1857, but can be readily distinguished from the latter by its smaller body size, the characteristic shape of the sides of pronotum and elytral base, the distinctly longer and strongly serrate antennae in males, and the different shape of the parameres. A distribution map and habitat photographs of the new species are also provided.

Keywords: click beetle, Dendrometrinae, Pingwu, Oxynopterini, taxonomy

中国四川北部丽叩甲属一新种记述（鞘翅目：叩甲科）

邱鹭[1]，阮用颖[2]，郑少志[3] & 邱见玥[1*]

[1]绵阳师范学院 生命科学院（生态林业学院），四川 绵阳 621000，中国

[2]深圳职业技术大学 植物保护研究中心，广东 深圳 518055，中国

[3]四川省绵阳生态环境监测中心站，四川 绵阳 621000，中国

*通讯作者

摘要：本文记述和图示了采自中国四川省绵阳市平武县的丽叩甲属新物种：平武丽叩甲 *Campsosternus pingwuensis* L. Qiu, Y.-Y. Ruan & J.-Y. Qiu, **sp. nov.**。该新种在形态上与朱肩丽叩甲 *Campsosternus gemma* Candèze, 1857 相似，但可通过较小的体型，前胸背板侧缘及鞘翅基部的形态，更长且呈弱栉状的雄虫触角，以及阳茎侧叶形状的不同而与后者相区别。文中亦提供了该新种的生境照片及地理分布图。

关键词：叩头虫，山叩甲亚科，平武，尖鞘叩甲族，分类学

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Introduction

The genus *Campsosternus* Latreille, 1834, belonging to the tribe Oxynopterini and subfamily Dendrometrinae, comprises a group of click beetles noted for their relatively large body size and vivid coloration (Jiang 1991; Kundrata *et al*. 2018). The genus is primarily distributed in the Oriental Region, with more than 80 species described worldwide, 20 of which are recorded from China (Jiang 1991; Bouwer 1992a, 1992b, 1993; Schimmel 1994, 2013; Suzuki 2002; Liu & Jiang 2019; Jiang & Yang 2023). Among the Chinese fauna, *Campsosternus gemma* Candèze, 1857, *Campsosternus auratus* (Drury, 1773), and *Campsosternus fruhstorferi* Schwarz, 1902 are the most widely distributed species. They are frequently encountered even in peri-urban habitats dominated by hilly terrain and are consequently the most familiar members of the genus to the general public.

However, despite the commonness of these widespread taxa, the diversity of the genus in specific mountainous regions remains insufficiently explored. During field surveys in the mountainous area of Pingwu County, northern Sichuan, the fourth author collected a series of specimens belonging to *Campsosternus*. Subsequent morphological examination revealed that these specimens possess a unique combination of characters that distinguish them from all known congeners. Here, we formally report this new species as *Campsosternus pingwuensis* L. Qiu, Y.-Y. Ruan & J.-Y. Qiu, **sp. nov.** This finding contributes to our understanding of *Campsosternus* diversity, particularly at its northern distributional limit.

Material and methods

Habitus and diagnostic character images were captured using a Canon EOS RP camera with a Laowa Mini FFII 85 mm F5.6 2× macro lens. Body length was measured from the anterior margin of the head to the apex of the elytra. Pronotal length was taken along the midline; pronotal width at the posterior angles; and body width at the broadest point of the elytra. The distribution map was generated using QGIS 3.42.3-Bratislava, and all figures (Fig. 1–3) were edited in Adobe Photoshop CC 2019.

Specimens examined in this study are deposited in the Invertebrate Collection of Mianyang Teachers' College, Mianyang, Sichuan, China (MYTC). To facilitate comparison of the new species with *Campsosternus gemma* also distributed in Mianyang City, the following specimens of the latter species were examined: 1 male (MYTC; Fig. 1D–E, Fig. 2D–F), Longtan Forest Park [龙潭森林公园], Mojia [磨家], Fucheng District [涪城区], Mianyang City, 1.VIII.2021, Lu Qiu leg.; 1 female (MYTC; Fig. 1F), Mianyang Teachers' College [绵阳师范学院], Mojia, Fucheng District, Mianyang City, VII.2022, Lu Qiu leg.

Taxonomy

Campsosternus pingwuensis L. Qiu, Y.-Y. Ruan & J.-Y. Qiu, sp. nov. 平武丽叩甲

https://zoobank.org/F9E71E9F-D366-4112-A5D0-D5B8B5879123

Figs. 1–3

Type locality. China: Sichuan: Mianyang City, Pingwu County, Longchiping, 1050 m.

Type material. Holotype: CHINA: Sichuan Province: male (MYTC), Longchiping Forest Park [龙池坪森林公园], Pingwu County [平武县], Mianyang City [绵阳市], 1050m, 6–8.VII.2019, Jian-Yue Qiu & Hao Xu leg. **Paratypes:** 1 male and 1 female (MYTC), same data as holotype.

Diagnosis and comparison. Bicolorous species; body overall metallic blue-green or yellowish-green; lateral margins of pronotum, hypomeron, and lateral margins of abdomen cinnabar-red. In males, antennae extending beyond hind angles of pronotum by ca. 1.5 antennomeres; antennomeres IV–X strongly serrate (Fig. 1A–C; 2A–C).

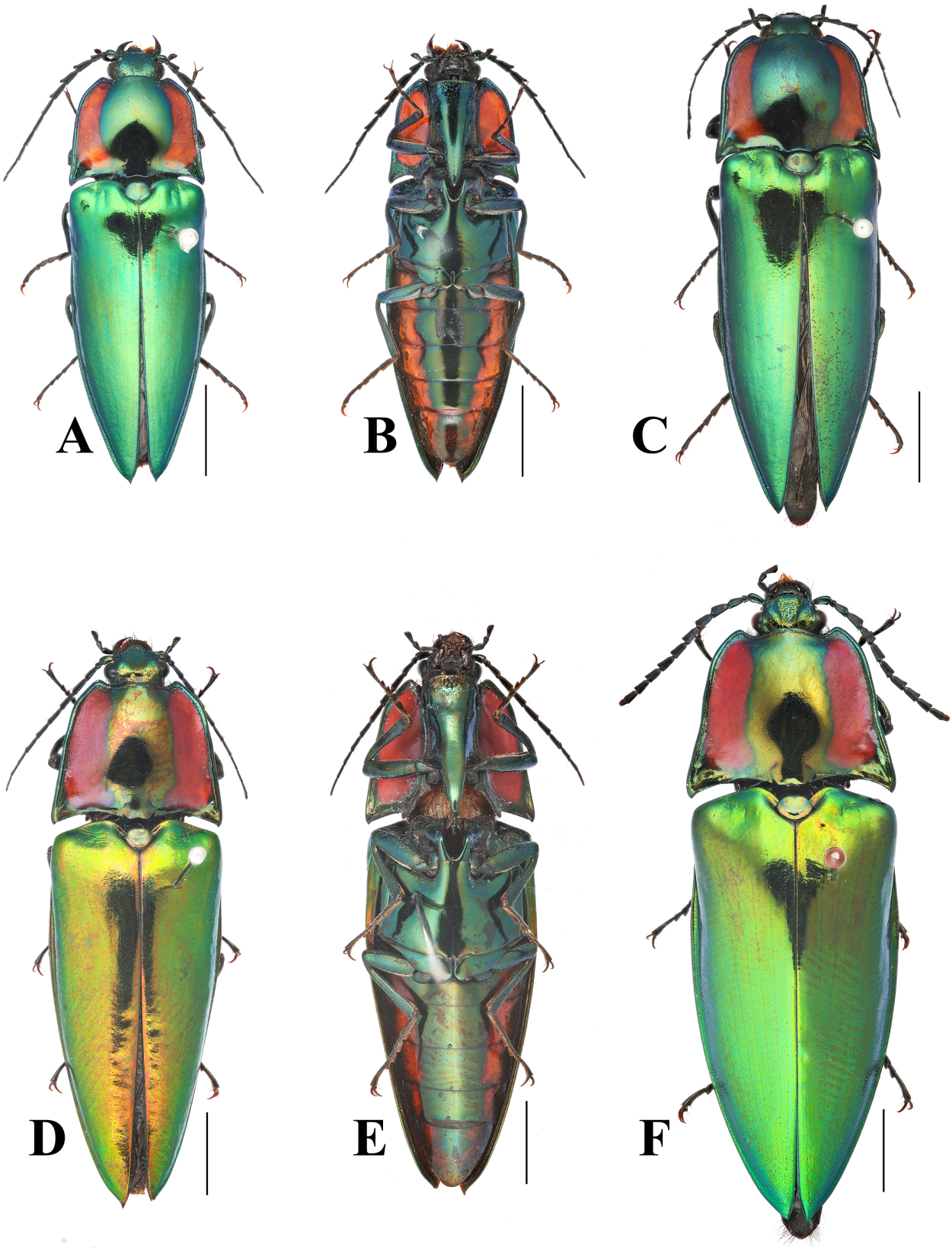

FIGURE 1. Habitus of *Campsosternus pingwuensis* L. Qiu, Y.-Y. Ruan & J.-Y. Qiu, **sp. nov.**: **A** Holotype, male, dorsal view **B** Holotype, male, ventral view **C** Paratype, female, dorsal view. Habitus of *Campsosternus gemma* Candèze, 1857 from Mianyang City: **D** Male, dorsal view **E** Male, ventral view **F** Female, dorsal view. Scale bars = 5 mm.

The new species resembles *Campsosternus gemma* (Fig. 1) by the similar coloration; notably, both species can be found in Mianyang City. However, the new species can be distinguished from the latter by the following combination of characters: (1) body smaller (22.3–27.2 mm vs. 32–40 mm in *C. gemma*); (2) pronotum with lateral sides less strongly widened posteriorly than in *C. gemma* (Fig. 2A, D), surface of cinnabar-red lateral maculae less rugose than those in *C. gemma* (Fig. 2A, D); (3) elytra with basal margin slightly produced in shallow arc and humeri obtuse (in *C. gemma*, inner part of basal margin distinctly produced in obtuse angle and humeri strongly produced in angular shape) (Fig. 2A, D); (4) scutellar shield elevated along longitudinal midline (usually depressed medially in *C. gemma*) (Fig. 2A, D); (5) in male, antennae extending beyond hind angles of pronotum by ca. 1.5 antennomeres, antennomeres IV–X strongly serrate, with short pectinate rami, antennomere XI longest (distinctly longer than antennomeres IV–VII); in female, antennae reaching hind angles (in *C. gemma*, antennae of male just reaching hind angles, while those of female not reaching hind angles by about 1–2 antennomeres; antennomeres III–X normally serrated, without short pectinate rami, and with antennomere XI shorter, subequal in length to IV–VII.) (Fig. 1A–F; 2B, E); (6) subapical hooked area of parameres longer and with sharper hook apices (Fig. 2C, F); length to width ratio of subapical hooked area: 1.66–1.72 (ratio: 1.28–1.46 in *C. gemma*, measured in two individuals).

Description. Holotype, male: body length 22.3 mm, width 7.0 mm, antenna length 9.6 mm, pronotum length × width = 5.2 × 7.0 mm, elytra length 15 mm.

Body elongate, smooth and glabrous. Coloration overall metallic blue-green with slight yellowish-green luster; ventral surface duller than dorsal surface. Labrum dark brown with dull metallic luster; mandibles dark metallic blue-green at base, remainder dark brown; maxillary palpi dark brown with faint metallic luster. Antennae with antennomere 1 metallic blue-green, antennomere 2 nearly black with slight metallic luster, antennomeres 3–11 blackish brown. Pronotum metallic blue-green, with broad cinnabar-red longitudinal maculae laterally; near inner margins of red maculae, metallic blue. Scutellar shield metallic blue. Elytra entirely metallic blue-green. Hypomeron cinnabar-red with metallic blue-green margins. Abdomen yellowish-green medially and cinnabar-red laterally. Legs dark metallic blue, darker toward apices; tarsi dark brown; claws reddish brown (Fig. 1A–B; 2A–B). Pubescence and setae mostly yellowish brown.

Head (Fig. 2A) smooth, medially bearing large trapezoidal depression; frons flat, with weakly elevated anterior margins. Punctation umbilicate; interpuncture spaces irregular, varying from less than one to approximately three puncture diameters. Labrum sub-trapezoidal, rugose on distal half, with small punctures concentrated distally. Antennae (Fig. 2B) extending beyond hind angles of pronotum by approximately 1.5 antennomeres. Antennomeres I–II with smooth and shining surface; antennomere I long and cylindrical; antennomere II shortest, sub-conical. Antennomeres from III onwards serrate, compressed, dull, surface densely covered with minute punctures; antennomere III triangular; antennomeres IV–X similar, elongate, each with one lateral margin straight and opposite margin obliquely truncate with short ramus, appearing strongly serrate; antennomere XI longest, lateral margins sub-parallel, abruptly narrowed at distal half, apex obtuse. Length ratio of antennomeres II: III: IV = 1: 2.2: 3.6.

Pronotum (Fig. 2A) sub-trapezoidal, surface smooth and glabrous, with sparse punctation; punctures significantly smaller and shallower than those on head, densest at anterolateral areas (interpuncture spaces ca. 2 times puncture diameter), gradually sparser, smaller, and shallower toward base (interpuncture spaces 5–7 times puncture diameter). Cinnabar-red maculae almost impunctate except at extreme anterior edge; medial and distal surfaces of maculae rugose with minute granulations, basal area smoother. Lateral margins of pronotum bordered by broad, elevated, smooth ridges; narrow furrow present along inner side of each ridge; anterior margin with ridge and furrow prominent laterally, fade towards middle, and completely disappear medially. Anterior margin slightly arcuate; anterior angles slightly produced, obtuse. Lateral margins obliquely truncate and narrowing anteriorly, remainder gradually widening posteriorly, widest across hind angles near apices. Hind angles triangularly produced, slightly incurved at apices, with a short, smooth longitudinal carina on surface. Posterior margin slightly produced posteriorly at middle, with a blunt triangular excavation at middle.

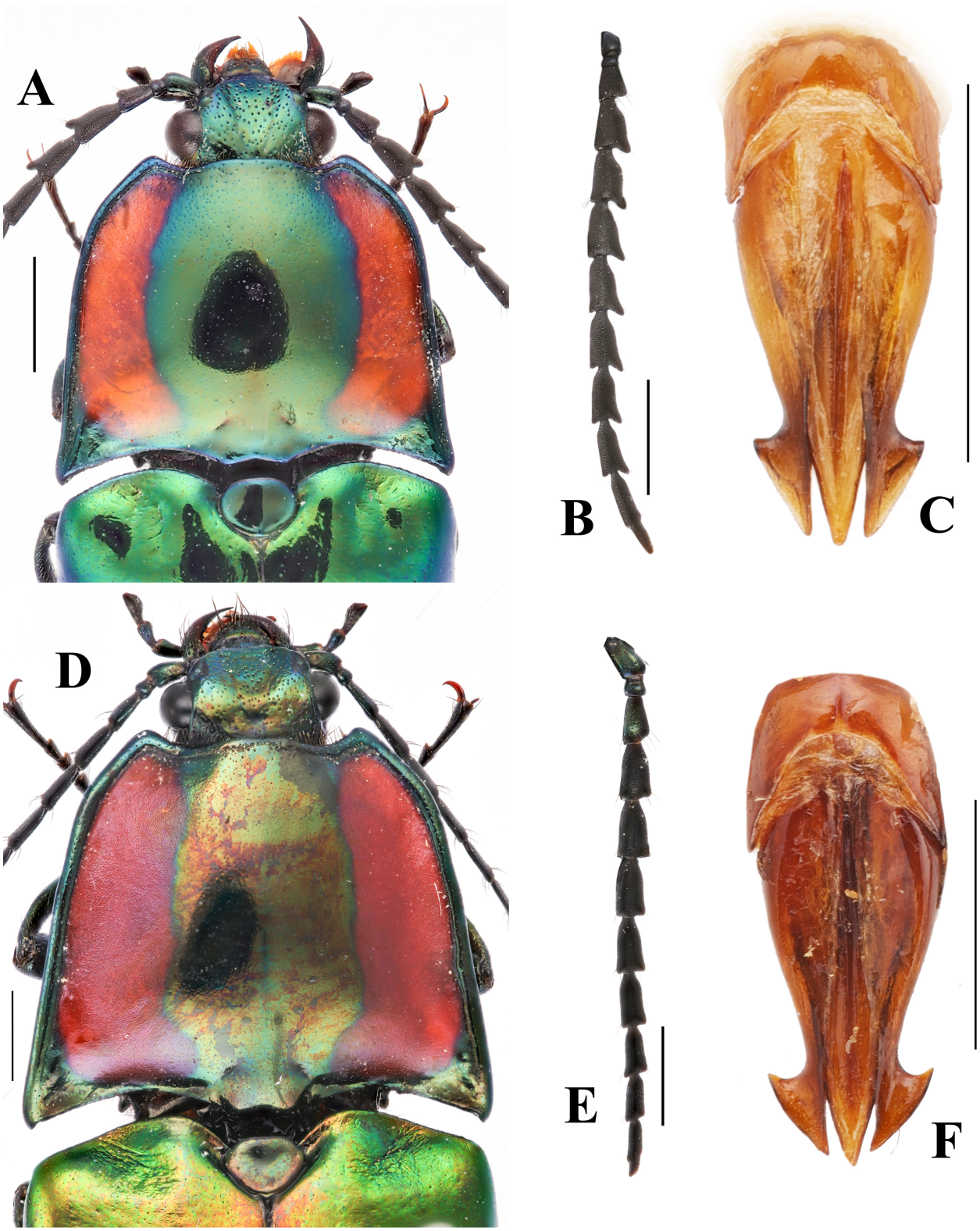

FIGURE 2. Characters of *Campsosternus pingwuensis* L. Qiu, Y.-Y. Ruan & J.-Y. Qiu, **sp. nov.**, male, holotype: **A** Head, pronotum and Scutellar shield, dorsal view **B** Antenna **C** Aedeagus, ventral view. Characters of *Campsosternus gemma* Candèze, 1857 from Mianyang City: **D** Head, pronotum and Scutellar shield, dorsal view **E** Antenna **F** Aedeagus, ventral view. Scale bars = 2 mm.

FIGURE 3. Distribution map and habitat photographs of *Campsosternus pingwuensis* L. Qiu, Y.-Y. Ruan & J.-Y. Qiu, **sp. nov.**: **A** Distribution map showing the type locality (red dot) **B** Mountainous landscape surrounding Pingwu County, viewed from Longchiping Forest Park (type locality). **C** Understory environment of the forest at Longchiping. B-C photographed by Lu Qiu.

Chin-piece (Fig. 1B) with distal margin weakly produced, relatively straight, without elevated ridge, bearing sparse, large umbilicate punctures; punctures abruptly becoming smaller and denser at base, then increasingly sparse toward base of prosternum. Prosternal process well-developed, with distinct, large notch on posterior margin in lateral view. Hypomeron with relatively shallow and small punctures, densest distally, sparse elsewhere. Metaventrite with shallow, sparse, small punctures. Abdomen with punctures denser than those on metaventrite; terminal ventrite tongue-shaped, surface with numerous short hairs. Femora and tibiae covered with short white hairs. Metacoxal plate gradually narrowing from mesal to lateral margin.

Scutellar shield (Fig. 2A) trans-elliptical, widest at middle, surface smooth and impunctate, slightly elevated along longitudinal midline.

Elytra (Fig. 1A) widest at base, as wide as pronotum, length/width ratio = 2.3: 1. Basal margin of each slightly

produced anteriorly in shallow arc; surface smooth with fine punctures, striae indistinct, only slightly depressed and formed by micro puncures; each elytron base with one large impression. Humeral angles obtuse. Lateral margins of elytra sub-parallel in basal half, gradually narrowing in distal half; apices spinous.

Aedeagus (Fig. 2C): median lobe robust, extending slightly beyond apices of parameres, gradually narrowing toward apex, apex obtuse. Paramere with well-developed subapical hook, tip of hook slightly obtuse; apical portion distinctly triangularly produced, produced part relatively narrow and elongate, with lateral margins straight and apex obtuse; length to width ratio of subapical hooked area: 1.66–1.72.

Male paratype: body length 22.0 mm. Generally similar to holotype, except head, pronotum, and elytra with yellowish-green luster.

Female paratype: body length 27.2 mm. Similar to holotype male in general habitus, but with more robust body; antennae normally serrate, only reaching hind angles of pronotum.

Distribution. China: Northern Sichuan (Fig. 3A).

Bionomics. This new species inhabits forests dominated by Fagaceae at an elevation of approximately 1000 m (Fig. 3B–C). Specimens were collected by sweeping the branches of Fagaceae trees (J.-Y. Qiu, personal observation). The life history of the new species is presumed to be similar to that of *Campsosternus gemma*. They likely feed on the sap flows exuding from the trunks or branches of the Fagaceae plants, which are frequently initiated by the boring activities of other insects, such as cerambycid beetles.

Etymology. The specific epithet is named after Pingwu County, the type locality of the new species.

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Additional information

Author contributions: L QIU was responsible for literature review and manuscript writing; J-Y QIU was responsible for specimen collection and project acquisition; Y-Y RUAN was responsible for data collection and project acquisition; S-Z ZHENG was responsible for project acquisition; L QIU, Y-Y RUAN, and J-Y QIU were responsible for the revision and refinement of the manuscript.

Conflict of interest: The authors declare that they have no competing interests.

Data availability: All supporting data for this study are available within the text of the article.

Ethical statement: This study does not involve any ethical review content required for declaration.

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